

Some records of Odonata collected in Tropical Africa

by

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The following notes and descriptions are concerned with various collections of dragonflies submitted in recent years to the National Museum, Bulawayo, by collectors in tropical Africa. Of all the species mentioned the most interesting is a new megapodagriid from East Africa, collected by Dr M. T. Gillies and submitted in a collection for identification by Dr P. Corbet. The author is particularly indebted to those entomologists who have presented material to this Museum. Firstly, Col. T. H. E. Jackson, of Kenya, whose assistant Mr B. K. Watuliki has sent many consignments from Eastern Nigeria and the Congo Republic (the former French Moyen Congo). The Nigerian specimens are partly from Mr D. W. Tarry, who collected a few dragonflies in Northern Nigeria, and partly from forests near Ikom, East of Enugu, Eastern Nigeria, an area visited by the author in 1958 (Pinhey, 1960). The Moyen Congo localities are Ketta and Mambili Forests, Ouesso District; Etoumbi Forest, Makoua District; Mekoum and Sembe Forests, Souanke District. Secondly, the Ghana (Prah-Annam Forest Reserve) and Togoland (Vane, 2500') collections are from Maj. F. L. Johnson. Thirdly, material from Mr P. C. Rougeot, collected in forest near Lastoursville, Gabon. Smaller collections are from an expedition to the former Belgian Congo, undertaken by Mr A. G. Plowes and a National Museum assistant, Mr R. Mpala. A few of the specimens sent by Dr P. Corbet have been donated to the Museum.

In his paper, the former French Moyen Congo, now Republic of the Congo, will be referred to as M. Congo, the other Congo Republic (Belgian Congo), being called Congo. The locality Ikom, mentioned above, is close to the border of South (former British) Cameroons, which itself lies to the North of Cameroons Republic (former French Cameroons).

The collections on the whole are poor in lestids and coenagriids, rich in the more bulky or conspicuous species. In fact the only lestid which will be mentioned is a species taken by Mr Tarry in Nigeria. Only the more interesting species from all these collections will be discussed here.

Family LESTIDAE

Lestes tarryi spec. nov., figs. 21a - b

HOLOTYPE (mature): Closely allied to *L. plagiatus* (Burm.) Labium ochreous; labrum, genae and anteclypeus pale olive-green; postclypeus, frons

and head above dark ferruginous-brown, back of occiput brownish-orange. Thorax greenish-ochreous, the prothorax with a pair of black median streaks; synthorax yellowish-ochre ventrally, the thorax marked like immature *plagiatus*; dark band on median carina; slender, metallic green antehumeral, incomplete ventrally; a longish similar bar on mesepimeron, a short streak on upper end of first lateral suture; a brownish suffusion and separate metallic dots on second suture. These thoracic markings vary in the paratypes and it does not seem desirable to figure the pattern here. The thorax has a very thin white pruinosity on sides and ventral surface.

Bases of legs, femora and tibiae ochreous; with black lines on flexor surfaces of femora and tibiae; tarsi black. Venation and pterostigma dark brown, the latter framed with paler edging except on its posterior border. Pterostigma shorter than in *plagiatus*. Forewing with 11-12 Px; Ac at end of petiole in all wings. Abdomen ochreous, with broad dorsal, metallic green-brown band, constricted at both ends of each segment; on 9-10 the band is absent, these segments being ochreous, with median black dorsal line and more or less continuous dorso-lateral lines. Superior appendage (figs 21a and b) shaped as in *plagiatus* (fig. 21c), but the teeth on the inner shelf are more developed and the subbasal tooth is distinctly less robust. Inferiors similar. Abdomen (without appendages) 31 mm, hindwing 22 mm, pterostigma 1.5 mm. In the two paratypes, abdomen 31 and 33 mm, hindwing 21.5 and 22.5 mm.

REMARKS: Named after Mr D. W. Tarry, who collected these males at Mailumba (N. Guinea Zone), N. Nigeia, 10 and 15.IV.1960, "on grass at stream pool in open woodland". Holo- and one paratype in National Museum, Bulawayo; one paratype in British Museum (Nat. Hist.), London. Slightly smaller than *plagiatus*, without, apparently, the dense pruinosity of adults of that species and with the superior appendage, especially the subbasal tooth, less robust. It is possible that it represents a Northern Nigerian race of that widespread species.

Family MEGAPODAGRIIDAE

This family is well represented in the Malgassian subregion and there is one genus in the Seychelles (*Allolestes* Sélys). Hitherto, on the African mainland the only known species has been *Neurolestes trinervis* Sélys, a very local forest insect in the South Cameroons; and the enormous and very distinctive *Coryphagrion grandis* Morton, of the East African coastal forests, an insect widely diverse from other megapodagriids. This latter species has been found to the South West of Mombasa, to the West and North of Tanga, in forests to the East of Morogoro and on the Pugu Hills, to the West of Dar-es-Salaam; all these localities being in Tanganyika and Kenya. Mr. B. R. Stuckenberg, of the Natal Museum believes he has seen a species of *Coryphagrion* Morton in the forest near the mouth of the Zambezi, but this report is so far unconfirmed. The following remarkable, banded megapodagriid adds one more to the continental Ethiopian fauna.

Genus *AMANIPODAGRION* gen. nov.

A moderate-sized megapodagriid, with a superficial resemblance to a banded synlestid. Body blackish, with sparse yellow marking. Labium broader than long, its median lobe deeply but narrowly cleft. Femoral and tibial spines long and slender: claw-hook well developed, robust, almost as long as the apical portion of the unguis. Abdomen longish; anal appendages of male robust, the superiors forcipate, armed with sub-basal tooth; accessory genitalia as in figure A.1. Nodus at slightly over one quarter wing-length from base; pterostigma robust, elongate, covering three to three and a half cells, braced; arculus at second of the two Ax; 20-22 Px; R_{4+5} arising proximally to sub-nodus IR_3 at this point or slightly distad; Ac about midway between the antenodals. Quadrilateral elongate, reaching origin of R_{4+5} , almost rectangular, with its anterior edge only a little shorter than the posterior; anal vein leaving margin far distal to Ac and distal to start of quadrilateral. Venation black, veins very straight, with only short, terminal intercalary sectors, encompassing few cells: between IR_2 and R_3 , R_3 and IR_3 , IR_3 and R_{4+5} . Wing apices evenly curved. Wings of mature male banded with brown.

In its reduction of supplementary wing sectors it resembles the otherwise very different *Coryphagrion* Morton. In this enormous zygopteran the wings are petiolate only to about the level of the Ac, and the quadrilateral has its lower distal angle acute. *Tatocnemis* Kirby generally also shows reduced intercalaries, but the subapical wing margins are uneven; the pterostigma is more rhomboidal; the arc is in a more distal position; the quadrilateral has an acute lower angle; IR_3 and R_{4+5} arise more distally. Unlike *Neurolestes* Sélys there are only two Ax and one Ac. The almost rectangular quadrilateral is also found in *Protolestes* Forster, but here it is shorter, IR_3 arises well beyond subnodus and the pterostigma is shorter. The discoidal cell is very like *Allolestes* Sélys, but here it is even longer than in the new genus, reaching almost to the subnodus. And in that genus the abdomen is shorter than the wings and the supplementary sectors are well developed. *Nesolestes* Sélys, again, has the acute-angled quadrilateral, among other differences.

Type species: *Amanipodagrion gilliesi* spec. nov.

REMARKS: The name "*Amanipodagrion*" is selected for the type locality, Amani, in the East Usambara Mountains. "Amani" infers "peace", a desirable commodity in some parts of this continent.

Amanipodagrion gilliesi spec. nov., figs. 1a-g

HOLOTYPE (body slightly damaged by psocid activity but only the prothorax has suffered in external characters): Labium, labrum and anteclypeus pale ochreous; postclypeus and head above black or blackish; basal segment of antenna pale brown, remainder dark brown. Prothorax apparently ochreous-brown with black markings, including irregular lateral and small central spots and a medial black patch on posterior lobe; synthorax blackish

to second lateral suture; a short yellow humeral streak, tapering ventrally, and a trace of a narrow, suffused yellowish antehumeral; a yellow stripe below first suture, tapering dorsally; lower sides and ventral surface pale yellow. Basal segments of legs yellowish; femora and tibiae greyish, with long, slender black spines; tarsi ferruginous.

Wings hyaline from base to arculus, the rest smoky-yellowish, with a broad reddish-brown transverse band, diffuse at edges, situated slightly nearer nodus than to apex. Venation and pterostigma black; venational features as in the generic review. Abdomen and anal appendages black, with whitish-yellow lateral markings; a patch on segment 1; basolateral patches, more or less triangular on segments 2-9; 10 all black. Superiors forcipate, very robust and spiny, slightly longer than segment 10; with subbasal tooth. The ends of the superiors are flattened ventrally. Inferior curved, tapering to small apical teeth; shorter than superior. Abdomen about 39 mm, hindwing 33 mm, pterostigma 2 mm.

REMARKS: Named after Dr M. T. Gillies, who collected two males at Amani, May 1959. Holotype in National Museum, Bulawayo; the paratype (unfortunately headless) will be sent to the British Museum (Nat. Hist.), London.

Coryphagrion grandis Morton, 1924

Entomologist 57: 218.

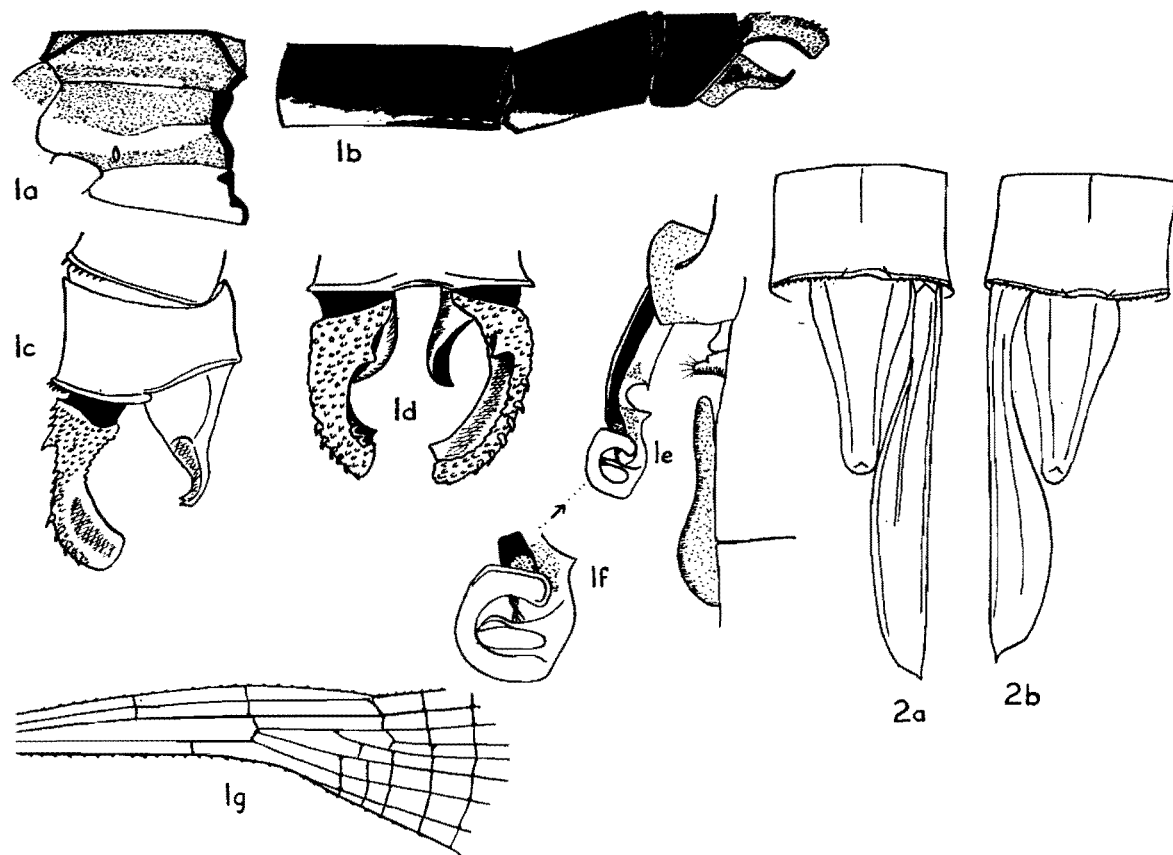
Mr R. H. Carcasson has informed the author that he observed this species 'laying in a toadstool full of water, high up in a tree, in the Jilore forest', near Malindi, Kenya coast, December 1960. The present author was unsuccessful in observing oviposition of this insect when visiting the East African coastal forests, although it was suspected that, like the tropical American pseudostigmatids, *Coryphagrion* would breed in pools of water in cup-shaped fronds or banana sheathes, and not in the forest streams. Carcasson's record is also well north of the northern limit known for the species (Shimba and Rabai Hills, Mombasa). The examples stated to have been seen by Stuckenberg (see above) were in Palm forests a short distance inland from the mouth of the Zambesi river in Moçambique. If this should prove to be the same species this is far south of its known southerly range (Dar-es-Salaam and Morogoro).

Family PROTONEURIDAE

Elattonaura pruinosa (Selys, 1886)

Disparoneura pruinosa Selys, 1886, *Mém. cour. Acad. R. Belg.* 38: 166; Sierra Leone.

Collected in Mambili Forest, M. Congo. A fairly widespread species in swampy West African forests.



1. *Amanipodagrion gilliesi* spec. nov., ♂. a. thorax, from left; b. end of abdomen, from left; c-d. anal appendages, from right and from above; e-f. accessory genitalia; g. base of right hindwing.
2. *Heliaeschna*, anal appendages and 10th segment dorsally of a. *sembe* spec. nov.; b. *ugandica*, males.

Elatoneura balli Kimmins, 1938

Ann. Mag. nat. Hist. (11)1: 296; Sierra Leone.

Closely allied to *pruinosa* and sometimes found in the same forests. Mambili Forest, M. Congo.

Prodasineura vittata (Sélys, 1886)

Disparoneura vittata Sélys, 1886, *loc. cit.*: 174.

A rather less common West African forest species. Females only, Mambili Forest, Etoumbi Forest, M. Congo.

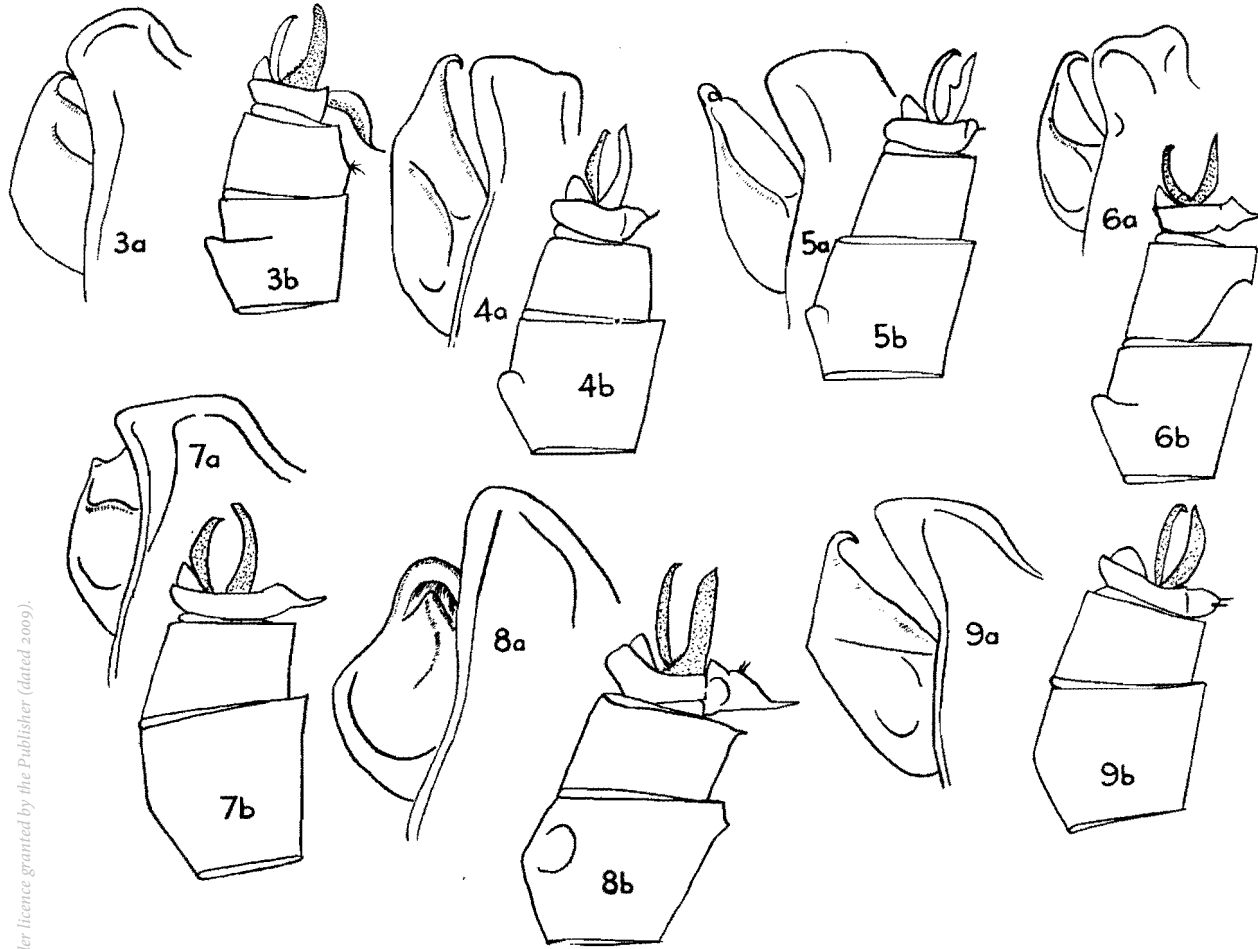
Prodasineura incerta spec. nov., figs. 19 a-e

HOLOTYPE (mature): Lips, all head and face black, except a white lateral streak on front of occiput leading from epistome to edge of eye. Prothorax and synthorax black with bronze-green sheen. Prothorax thinly dusted with white pruinosity; synthorax without pale antehumerals but with a somewhat rounded pale blue-pruinose patch on lower half of mesepisternum; a broad yellow stripe below first lateral suture and a diffuse yellow stripe on posterior edge of metepimeron. Legs black; claw-hooks small. Venation blackish, pterostigma dark brown, edged with cream, between black veins. Arculus beyond second Ax; forewing with 15-16 Px; R_{4+5} arising just before subnodus; Ac well beyond petiole. Anal vein very variable in each male, sometimes very short, often almost or just reaching level of distal end of quadrilateral. Cu reaching just beyond first Px in forewing and beyond second Px in hindwing. Abdomen black, segment 1 with large and small white lateral, triangular spots; 2 with laterodistal white triangle; 8-9 above dusted with pale blue pruinosity. Appendages black; superiors conical, with pale (less chitinized) apical point; a large medial, subventral flattened tooth; a small, laterobasal tooth. Inferior with pale (less chitinized) outer margin.

♂ - **PARATYPE** (two adult, one teneral); Pruinosity absent (not developed or removed after death ?); anal vein unstable. In a teneral male the anal appendages are all creamy white.

Abdomen 28.5-29.5 mm, hindwing 18-19.5 mm.

♀ - **ALLOTYPE** (mature): Differing from male in following respects: The pale lateral stripes on front of head link up medially across base of postclypeus and front of frons, although this band is almost severed in the centre. Prothorax with yellow lateral stripe (coated with pure white pruinosity), this stripe continuing on to ventral end of mesepisternum as a very abbreviated antehumeral. Anal vein more stable, just or almost reaching level of distal end of quadrilateral in all wings. Segment 3 of abdomen with fine, basal yellow annulus, incomplete dorsally. Prothoracic stylets replaced by slightly bilobed flak on posterior edge of median lobe.



3-11. *Macromia*. a. accessory genitalia, from right; b. terminal segments of abdomen, from right. (dotted areas on anal appendages, and on the dorsal horn of 10th segment of 1b are black; clear areas on these same appendages are yellow). 3. *pallidinervis*; 4. *kochi*; 5. *schoutedeni*; 6. *aequatorialis*; 7. *funicularia*; 8. *lieftincki*; 9. *bispina*.

♀ - PARATYPE: In one example the white pruinosity has not developed (but it is not teneral), so that the thoracic stripe is all yellow. Anal vein variable in length but much more stable than in male; normally as in the allotype. Variable in size: abdomen 30-32 mm, hindwing 19-20 mm.

REMARKS: Four males and a longer series of females, from Etoumbi Forest, M. Congo, August 1960 (B.K. Watuliki). The species differs from *P. vittata* (Selys) and *P. villiersi* Fraser in lacking antehumeral stripes in the male (except for the blue-pruinose patch); the female has only very short antehumerals, unlike these other species. Moreover, the two pairs of stylets on the prothorax are replaced here by a single broad lobe. This insect is called *incerta* because of the unstable anal vein. In some examples it might almost suit the *Elatoneura* Cowley condition, but even in these it is curved down distally, instead of being almost straight. In the blue pruinosity of the holotype thorax it is reminiscent of *E. pruinosa* (Selys), which, however, is a genuine *Elatoneura* in its anal vein development. The large tooth on the male superior appendage, although not truly ventral in position, is also like the condition found in some *Elatoneura* species. By the venational instability it would appear that this species is in a transition stage from *Elatoneura* ancestry, the female being nearer that genus; but the prothoracic lobes suggest some other development and it might require another genus. The Oriental *Phylloneura* Fraser has, in the female, a prothoracic development slightly nearer that found in the present species. Holo-, allotype, one teneral ♂- and six ♀-paratypes in the National Museum, Bulawayo; a pair of paratypes will be deposited in the British Museum (Nat. Hist.), London, and another pair in the Coryndon Museum, Nairobi.

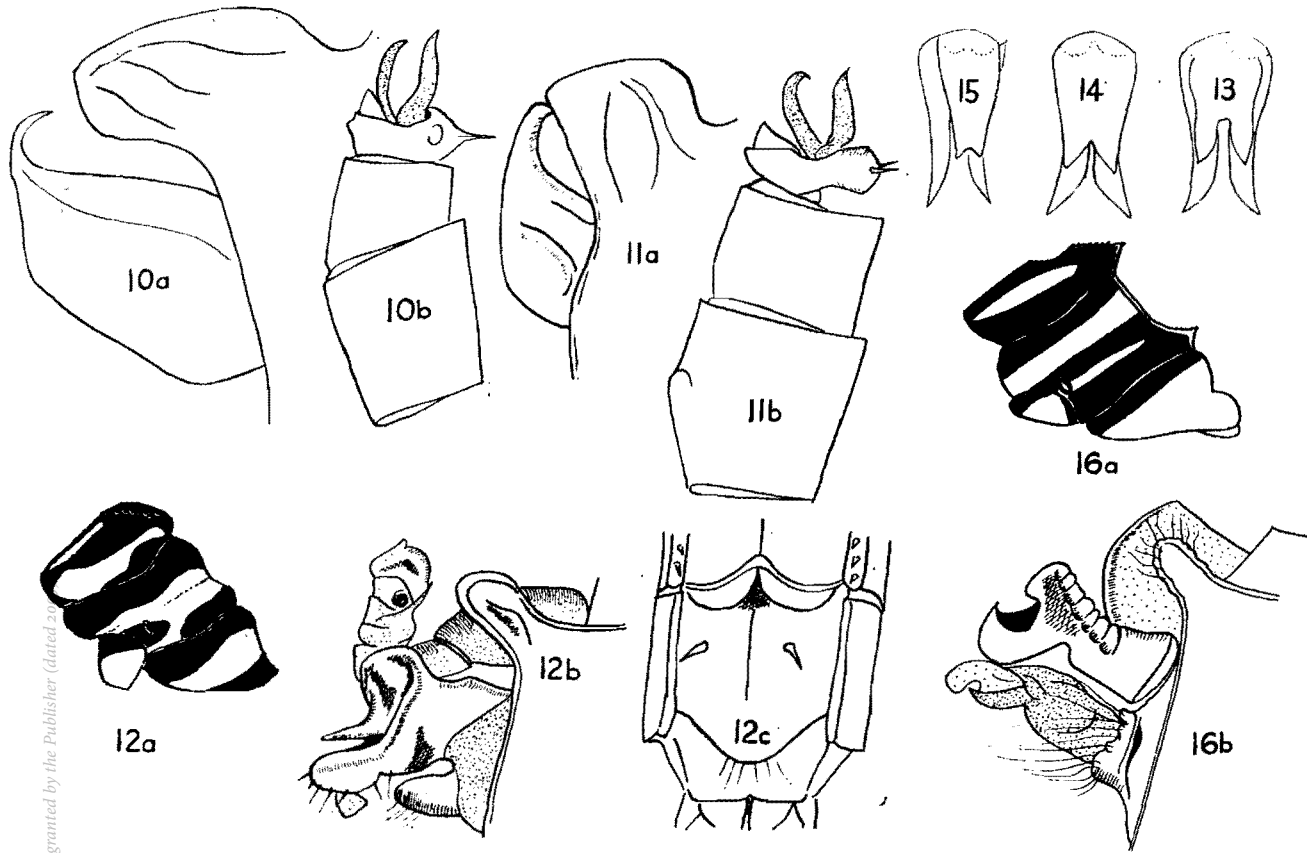
Family COENAGRIIDAE

Enallagma vansomereni Pinhey, 1955, fig. 22 a-e

Occ. Pap. Coryndon Mus. 4: 26, fig. 4.

E. nigradorsum Schmidt (nec Selys), 1949. Arch Mus. Bocage 20: 134, fig. 4; syn. nov.

Two males, one of them teneral, were submitted by Tarry, who collected them on the edge of a lake at Kalatu, N. Nigeria, 1.V.1960. Gambles has drawn the present author's attention to the fact that this insect is the same as that described as *Enallagma nigradorsum* by Schmidt (1949). This is not the species described by Selys as *nigradorsum*, which is an East and South African species of larger dimensions and with the superior appendage shorter and more obtuse. In the abdominal markings in this illustration (i.e. of *E. vansomereni*) Schmidt shows a large basal, conical patch on segment 8 (a Senegal specimen). This is also seen in varieties of Paimol, Uganda (type locality) specimens (fig. 22a), although normally the basal marking on this segment is reduced to



10-11. *Macromia*. Description as in 3-9. 10. *aeneothorax*; 11. *bicornis* (Fr. Guinea).

12. *Neodythemis africana*. a. thorax, from left, of male; b. extruded accessory genitalia, from right; c. terminal segments of female, from below.

13-15. *Tetrathemis*. Inferior appendage of male, from below (camera lucida sketches, G. Arnold).

13. *sulci* spec. nov. 14. *bifida*. 15. *camerunensis*.

16. *Aethiothemis watulikii* spec. nov., ♂. a. thorax, from left. b. extruded accessory genitalia, from right.

a small triangle (fig. 22b). A Uganda example is shown here, as well as the markings on the more mature Nigerian male (showing much reduction of the black) and the 10th segment of the teneral Nigerian specimen (fig. 22c), where the black saddle is reduced to transverse basal and distal lines. In the mature specimen the postclypeus is blue-green like the rest of the face. The juvenile example, however, has a black postclypeus, as in the Uganda *vansomereni*. In fact, it is evident that this is a variable species.

Anal appendages (fig. 22d), however, are typical in the Nigerian specimens. As indicated in the diagrams here the superior appendage, conical in side view, is well chitinated and black and has a black ventral tooth; the apex of the main appendage is slightly hooked. On the inner surface (fig. 22e), between main stem and tooth there is a softer area, white in teneral condition, bluish in adult. The inferior appendage slopes obliquely upwards to an incurved chitinous point.

Examples of this species with the heavier black markings on segments 8 to 10 are very similar in this respect to the normal form of *E. nigridorsum* Sélys.

Enallagma longfieldae Fraser, 1947

Proc. R. ent. Soc. Lond. (B) 16: 146, ff.; Uganda.

Kabambare, Katanga, Congo (Plowes). This record extends the range of this species from Uganda to the Southern Congo.

? *Enallagma camerunense* Karsch, 1899

Ent. Nachr. 25: 168; Cameroons.

Prah-Annam, Ghana; not a true *Enallagma*.

Aciagrion ? *hamoni* Fraser, 1955

Rev. franç. Ent. 22: 240; Congo.

A small female of the genus *Aciagrion*, the size of *stecleae* Kimmins, but with the black on the thorax very reduced may be a small specimen of *hamoni*. It was captured in Etoumbi Forest, M. Congo.

Pseudagrion glaucoideum Ris, 1936

Abh. senckenb. naturf. Ges. 433: 66, f.; Congo.

A little known West African species. Etoumbi Forest, M. Congo.

Pseudagrion conspicuum Fraser, 1947

Trans. R. ent. Soc. Lond. 98: 27; ♂, Ivory Coast; idem, 1949, *Explor. Parc nat. Albert Miss. de Witte* 61: 9; ♂ and ♀, Congo.

Fraser (1949) records the female without describing it. A specimen in

Copenhagen Museum (in a collection sent to the present author for identification) is almost certainly this species. This solitary female was collected by Sv. Herold Olsen at Zérékoré, in the former French Guinea. Like the male it is very slender, with a narrow head. Face in front ochreous, postclypeus black. Head above stained but certainly mainly black, with yellowish anterior markings and antennae; large pyriform postocular spots. Prothorax black, with yellow anterior border and lateral line. Stylets black, just over one third the length of the median lobe of the prothorax; synthorax black only to just below humeral suture; with yellow antehumeral about half as wide as mesepisternum and constricted laterally before upper end. Sides of thorax and the legs plain ochreous. Venation brown, paler near base; pterostigma rhomboidal, pale brown. Forewing with 13-14 Px. Abdomen with black dorsal band, swollen at distal ends of segments, 8 apparently pale over basal three-quarters, but this may only result from post-mortem changes. Cerci short, ovipositor stylets rather long. Abdomen 31 mm, hindwing 22 mm. It is, perhaps, now advisable to designate this as the metallotype without seeing males from the same locality.

Family CHLOROCYPHIDAE

Chlorocypha cancellata (Sélys, 1879)

Libellago cancellata Sélys, 1879, *Bull. Acad. Belg.* (2) 47: 37, 383; Cameroons.

Ikom, Nigeria. Locally common in West Africa; especially in East Nigeria and in the Ituri Forest of the Congo.

C. curta (Hagen, 1853)

Libellago curta Hagen, 1853, in Sélys, *loc. cit.* 20. Annexe: 58 Guinea).

Locally common in parts of tropical Africa. Lastoursville, Gabon.

C. cyanifrons (Sélys, 1873)

Libellago cyanifrons Sélys, 1873, *loc. cit.* (2) 35: 493.

Common in the Ituri Forest and elsewhere. Ikom, E. Nigeria; Mekoum Forest, M. Congo.

Chlorocypha picta spec. nov., fig. 17 a-c

♂. HOLOTYPE (mature): A very small species. Labium yellow, black anteriorly; labrum black; epistome in front purple, above black, with trace of pale spot (which would be more conspicuous in juveniles). Head above black, with broad orange U which almost reaches lateral ocelli; orange triangular postocular spots. Prothorax black, with orange anterior and posterior borders, small pale median and lateral spots; synthorax black above and almost to first lateral suture, with fish-hook antehumerals developed but

slender; sides yellowish with broad black band on second lateral suture. Coxae, distal ends of femora and the tarsi black, the legs otherwise bright yellow; an unusual feature, recalling the coloured, but expanded tibiae of the genus *Platycypha* Fraser. Wings hyaline but with bases amber as far as nodus; pterostigma black and very small. Discoidal cell with one cross-vein; IR_2 bifurcate proximally to pterostigma; and unusual feature in *Chlorocypha* Fraser, rather like the condition in *Calocypha* Fraser, but here with Ac distal to petiole. This bifurcation is probably of only minor significance since it occurs in the next smallest African species, *Chlorocypha neptunus* (Sjoestedt); but in that species this fork is beyond the middle of the pterostigma. Abdomen rather slender; black above, marked with pale areas as in the figure; those on segments 1-7 orange-red, on 8-10 bluish (most probably sky-blue in life). Appendages black, the inferiors rather longer than in most *Chlorocypha*. Abdomen 14.5 mm, hindwing 15 mm, pterostigma 1.2 mm.

PARATYPES very similar.

♀ - ALLOTYPE (mature): Head marking very like male, the epistome also purple in front, but dorsally with a large pale spot and a pair of such spots on the frons. Thorax as in male, the antehumerals slightly broader. Legs black; femora yellowish at base, particularly on inner side; tibiae dull yellowish, brownish in flexor surfaces; tarsi black. Wings hyaline, greenish-fumose at base and along costal zone (in older examples the rest of the wing is fumose). Pterostigma grey-brown with pale yellow central dot. Abdomen above black with dull greenish-yellow markings arranged as in the figure; laterally on segments 2-7 with yellow mid-lateral streak and sublateral spot. Abdomen 13 mm, hindwing 17 mm, pterostigma 1.3 mm.

PARATYPES similar. Wings more smoky in some specimens.

REMARKS: Two males and a longer series of females, from Etoumbi Forest, Makoua, M. Congo, August 1960 (B. K. Watuliki). This colourfully marked species (with obvious choice of name) is the smallest of the family so far recorded in Africa. The next smallest is *C. neptunus* (Sjoestedt), a much duller insect in colour, not so slender and differing in other respects. Apart from its very small size, this new species, is distinctive in the bicoloured abdomen, reddish on most segments, blue on the terminal ones. In this respect it resembles the slender *curta* (Hagen), which, however, is scarlet and blue and has much reduced black markings; and the *cancellata-hintzi* group, in which the basal segments are greenish and brownish, the terminal ones purple; and in that group the mesepisterna are pale and thus lack fish-hook antehumerals. Another obvious feature in the new insect is the bright yellow colour of the legs and the conspicuous black knees; in this respect it differs from all true *Chlorocypha* species and since the tibiae are not expanded it cannot be relegated to *Platycypha*. Because of its bifurcate IR_2 , the longish inferior appendages and the vivid legs it might be considered necessary later to erect a subgenus for this species; but it hardly deserves higher rank.

Holo- and one ♂-paratype, allo- and ten ♀-paratypes are in the National Museum, Bulawayo; one pair of paratypes will be sent to the British Museum (Nat. Hist.), London and another pair to Coryndon Museum, Nairobi.

C. dispar ovulosa Fraser, 1947, fig. 18

Trans. R. ent. Soc. Lond. 98: 23.

One male, probably of this form or race, in the Etoumbi Forest, Makoua, M. Congo, August 1960 (leg. Watuliki). The rounded spot on segment 2 of the abdomen is not completely divided by the black median line as in typical *ovulosa*, and there are indications of lateral extensions to the spot which are fading out. It may be a slightly younger specimen, and in all probability it is a development of *C. d. pyriiformosa* Fraser, 1947.

C. dispar cordosa Fraser, 1947

Trans. R. ent. Soc. Lond. 98: 23.

One male, Mount Hoyo, Ituri Forest, Congo, March 1959, collected by R. Carcasson and presented to the National Museum, Bulawayo.

Chlorocypha sp. near *dahli* Fraser, 1956

Bull. Inst. franç. Afr. noire 13: 940; Cameroons.

Unlike true *dahli* the head markings are greenish, not orange; but colour-changes both in life and after death are misleading in this genus. The thoracic "fish-hook" mark is very broad. Abdomen red, with free black distal dots on 2-3. A large insect, hindwing 24 mm. Ketta Forest, M. Congo.

C. gracilis (Karsch, 1899)

Libellago gracilis Karsch, 1899, *Ent. Nachr.* 25: 163.

An elegant little dark species, related to *dispar* (Beauvois). Mekoum and Sembe Forests, M. Congo. It is common in the South Cameroons.

C. luminosa (Karsch, 1893)

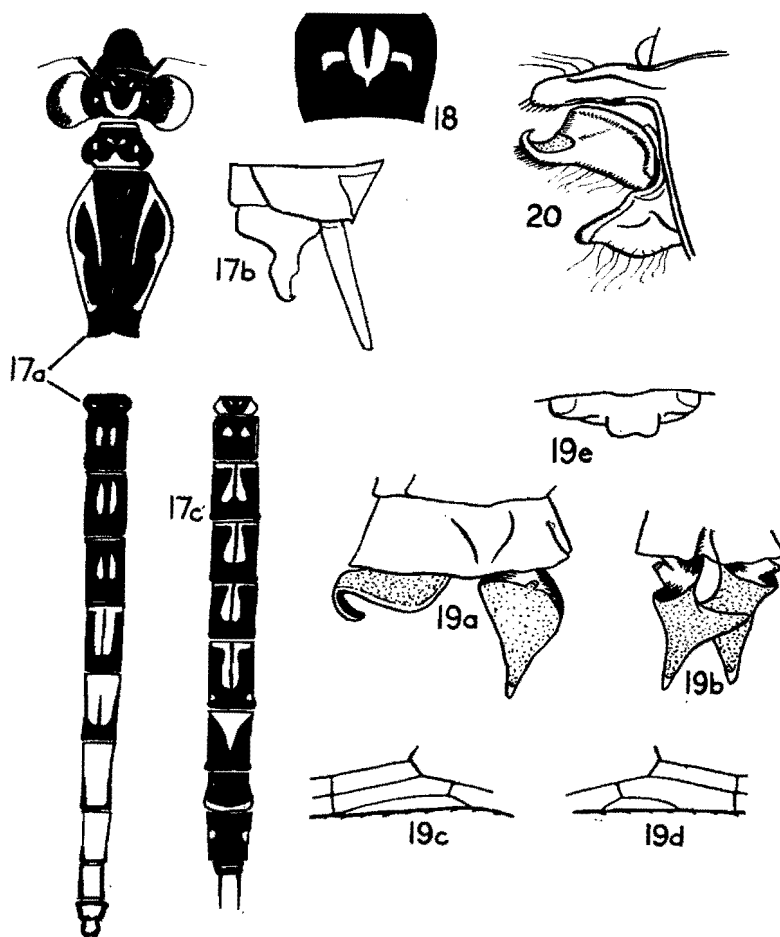
Libellago luminosa Karsch, 1893, *Berl. ent. Z.* 38: 33; Togoland.

Vane, Togoland; Benin, Nigeria. It is one of the commonest species in south Central Africa.

C. rubida (Hagen, 1853)

Libellago rubida Hagen, 1853, in Sélys, *Bull. Acad. Belg.* 20, Annexe 58; Guinea.

Locally common in equatorial Africa. Ikom, E. Nigeria; Lastoursville, Gabon.



17. *Chlorocypha picta* spec. nov., a-b. ♂, head and body markings; 10th segment and anal appendages; c. abdomen of female.
18. *Chlorocypha dispar ovulosa*, ♂ abdominal segment 2.
19. *Prodasineura incerta* spec. nov., a-b. ♂, anal appendages, from left and from above; c-d. type ♂, base of left and right forewings, respectively; e. ♀, hindlobe of prothorax.
20. *Trithemis fumosa* spec. nov., ♂, accessory genitalia, from right.

C. selysi (Karsch, 1899)

Libellago selysi Karsch, 1899, *Ent. Nachr.* **25**: 165.

Ibadan, S. Nigeria; Lastoursville, Gabon.

C. straeleni Fraser, 1949

Bull. Inst. Sci. nat. Belg. **25**: 28, ff.; Uganda.

Ikom, Nigeria; Sembe Forest, M. Congo; Itula, Congo (Plowes).

Family AGRIIDAE

Phaon camerunensis Sjoestedt, 1899

Bih. svensk. VetenskAkad. Handl. **25**: (48); Cameroons.

Fairly widespread in West African forests. Mambili Forest, M. Congo.

P. iridipennis occidentalis Foerster, 1906

Jb. nassau. Ver. Naturk. **59**: 330-1; Cameroons.

Apparently local in tropical African forests. Mambili Forest, M. Congo.

Umma cincta (Hagen, 1853)

Cleis cincta Hagen, 1853, in Sélys, *Bull. Acad. Belg.* **20**, Suppl. 23.

Ibadan, Nigeria; Vane, Togoland. In the Congo and Cameroons this species seems to be replaced by *mesostigma* Sélys, *longistigma* Sélys and *saphirina* Foerster, all common species.

Sapho ciliata (Fabricius, 1781)

Agriion ciliatum Fabricius, 1781, *Species Insectorum* ... **1**: 528, Sierra Leone.

Vane, Togoland; Prah-Annam, Ghana. Evidently very common in both areas and replacing *orichalcea* McL. of South Cameroons and Nigeria, and *gloriosa* Sélys of (French) Cameroons.

S. bicolor Sélys, 1853

Bull. Acad. Belg. **20**, Suppl. 21; Guinea.

Considered a scarce species. One ♂ from Prah-Annam, Ghana.

S. superba Sjoestedt, 1917

Ark. Zool. **14**: 10, pl.; Cameroons.

Very similar to the last but of wider distribution and with the hindwing broader. Mamfe, South Cameroons; Ketta, Etoumbi and Mambili Forests, M. Congo.

S. gloriosa Sélys, 1873.

Bull. Acad. Belg. (2) 36b: 611; Gabon.

The commonest species of *Sapho* in the former French Equatorial African region. Ketta and Mambili Forests, M. Congo; Lastoursville, Gabon.

Family GOMPHIDAE

Ictinogomphus ferox (Rambur, 1842)

Ictinus ferox Rambur, 1842, Névroptères: 172.

A few years ago, Dr P. Corbet submitted a consignment of Odonata containing three very teneral specimens (two males, one female) of an *Ictinogomphus* collected in a mercury vapour light trap, at Kigoma, on the north-east shores of Lake Tanganyika, 16-17.VIII.1956. Although distinctly smaller than *I. ferox* (Rambur), to which they were closely related, it did not seem advisable to describe them as a new race or species, since their markings were faint and some of the body features (genitalia, etc.) somewhat crumpled. Since that time two other species have been described: the large and dark *I. fraseri* Kimmins, 1958, and the small and paler *I. dundoensis* Pinhey, 1961, the latter only known in the female. On request, Mr A. E. Gardner, now holding Corbet's material, kindly resubmitted the Kigoma examples for further study.

It is evident, however, that in markings, anal appendages, flaps on segment 8, cerci and vulvar scales it is very close indeed to *I. ferox* (Rambur), or to the variety of that species, *f. pugnax* (Sélys). Accessory genitalia of the male are too crumpled for close comparison without dissection and manipulation. The only obvious difference is in size:

Kigoma species: ♂ and ♀ : abdomen 42 mm, hindwing 41-42 mm,
pterostigma 5.5-5 mm.

I. ferox : ♂ and ♀ : abdomen 50-53 mm, hindwing 43-45 mm,
pterostigma 5.5-6 mm.

I. regisalberti (Schouteden, 1934) and *I. fraseri* Kimmins are very large and much darker species. *I. dundoensis* Pinhey is as small as the Kigoma insect but differs markedly in the shape of the discoidal cell of the forewing, the body markings and the great reduction of the flaps on segment 8 of female.

In lieu of more mature individuals it is therefore only safe to suggest that the Kigoma specimens are a dwarf form or race of *ferox* (Rambur). Gardner has kindly intimated that one of the males may be retained in the National Museum. No varietal name is required at this stage for these insects.

Ictinogomphus fraseri Kimmins, 1958

Bull. Brit. Mus. (nat. Hist.) (b) 7: 354, ff.; Sierra Leone.

One male from Vane, Togoland, April 1955. The abdomen is incomplete, but the thoracic markings and accessory genitalia agree with *fraseri*.

Diastatomma tricolor (Beauvois, 1805)

Aeshna tricolor Beauvois, 1805, *Insectes recueillis en Afrique et en Amérique* ...: 67, pl. 3.

Mambili and Ketta Forests, M. Congo. The author has also taken this at Douala, Cameroons.

D. ? bicolor Sélys, 1869

Bull. Acad. Belg. (2) 28: 201; Old Calabar.

One male, Ikom, East Nigeria (Old Calabar Region). In its appendages and dark thorax this specimen agrees with *bicolor* but the antehumeral stripe, as in *tricolor*, is confluent with the mesothoracic collar. It may be a variety or race of *tricolor* (Beauvois).

D. multilineata Fraser, 1949

Rev. Zool. Bot. afr. 42: 112 ff.; Congo.

A little known species; Prah-Annam, Ghana.

D. selysi Schouteden, 1934

Ann. Mus Congo belge 4to (c) 3(1): 38; Congo.

Ketta and Mambili Forests, M. Congo. Closely allied to *multilineata* Fraser and *ruwenzorica* Pinhey.

D. ruwenzorica Pinhey, 1961

A survey of the dragonflies of Eastern Africa: 63

Described from the Congo-Uganda border. One teneral male, Lastoursville, Gabon.

Gomphidia balii Fraser, 1949

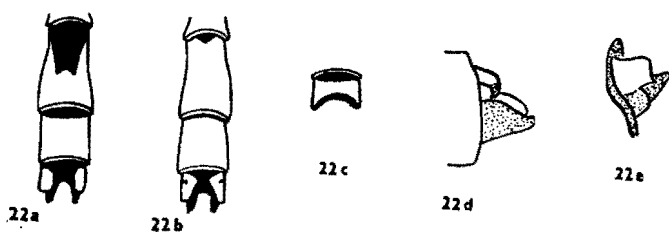
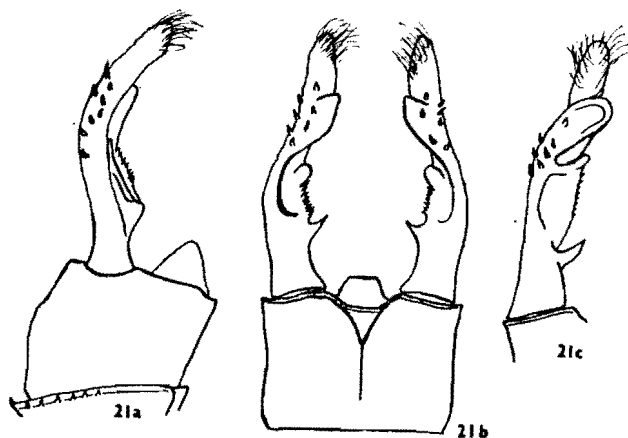
Rev. Zool. Bot. afr. 42: 106 ff.; Congo.

Ketta Forest, M. Congo.

G. madi Pinhey, 1961

loc. cit.: 64.

Described from Northern Uganda, a short series was collected at the Kasuma Falls, Victoria Nile, Uganda (Corbet).



21. *Lestes*. a-b. *tarryi* spec. nov., ♂ anal appendages, from left and from above. c. *plagiatus* (Salisbury, S. Rhodesia), ♂ right superior appendage.
22. *Enallagma vansomereni*. a-b. terminal three segments of abdomen in ♂, a. variety from Paimol, Northern Uganda. b. typical example from Northern Nigeria. c. 10th abdominal segment of teneral ♂, from above. d. anal appendages, from right. e. right superior appendage, from inner surface.

Genus *LESTINOGOMPHUS* Martin, 1911

Two species have so far been described under this genus in Africa: the type species *angustus* Martin, 1911, a male from Kenya, and *africanus* (Fraser, 1926), a teneral male from Sierra Leone. Both have 14 Ax in forewing and their dimensions are very similar. The present author has taken numerous examples, assumed to be *africanus*, at the Victoria Falls, and has taken or received single specimens from other localities. Most of these are of similar size to the Victoria Falls examples, but usually with fewer Ax in the forewing. Two females, however, are distinctly larger than females taken at the Falls, one of these being from Turiani (East-Central Tanganyika), the other from Bertoua, in former French Equatorial Africa. The differences in colour and markings in the two types, *angustus* and *africanus*, cannot perhaps be accepted as specific distinctions, since *africanus* was described from a teneral specimen. It seems possible that they are conspecific and that others of similar size may be the same species, i.e. *angustus*. It is possible that the larger females represent a new species, which must await description until males are available. A comparative table of size and of the number of antenodal crossveins may be of interest:

Examples	Number of Ax in Forewing	Abdomen in mm.	Hindwing in mm.
type <i>angustus</i> ♂, Kenya	14	32	21
type <i>africanus</i> ♂, Sierra Leone	14	28	19
N. Rhodesia ♂ ♂ Vict. Falls; Mwinilunga; Lastoursville, Gabon	10—12	28—30	19—22
♂, Salisbury, S. Rhodesia	12—13	29	21
♂, Jinja, Uganda	13	29	21
♀, Victoria Falls	11—13	29—30	22—23.5
♀, Turiani, Tanganyika	13—14	34	24
♀, Bertoua, Equat. Africa	16	34	25.5

From the data available at present the only significant difference is the larger size of the last two females. But it may be mentioned that a larva described by Corbet (1956) from Uganda is distinctly broader than one described by the present author (1959) from the Victoria Falls.

Neurogomphus uelensis Schouteden, 1934

Ann. Mus. Congo belge 4to (c) 3(1): 65.

A scarce species in a little known genus from tropical Africa. A male from Mekoum Forest, M. Congo.

Phyllogomphus aethiops Sélys, 1854

Bull. Acad. Belg. (2) 21: 43; Gambia

One male of this West African species from Vane, Togoland.

Notogomphus ? *anaci* Fraser, 1955

Rev. Zool. Bot. afr. 51: 42; Congo.

A large female from Sembe Forest, M. Congo, probably belongs to this species.

Family AESHNIDAE

Heliaeschna libyana (Fraser, 1928)

Gynacantha libyana Fraser, 1928, *Trans. ent. Soc. Lond.* 76: 136; Uganda.

Sembe Forest, M. Congo. This extends the range of this Uganda species.

H. fuliginosa Karsch, 1893

Ent. Nachr. 19: 194; Cameroons.

A West African species. Ikom, Nigeria; Etoumbi Forest, M. Congo.

Heliaeschna sembe spec. nov., fig. 2a

♂·HOLOTYPE (mature): Nearest *H. ugandica* McLachlan (1896, Uganda). Labium and lower surface of occiput yellow; labrum, genae and anteclypeus pale ferruginous; postclypeus and frons olive-green, frons above darkened at base; vertex and back of occiput black. Thorax dorsally and inter-alary bright olive-green, at sides with yellowish tint. Femora ferruginous, blackening apically and along flexor surfaces; tibiae and tarsi black. Venation and pterostigma black; mere trace of basal amber; forewing with 25 Ax, 2nd and 9th primary; triangles, hypertriangles and medial spaces with numerous cross-veins; anal triangle 3-celled. Abdominal segment 1 yellowish; 2 green with faint broad, black saddle, severed medially; auricles as in *ugandica*; 3-7 blackish, with green basolateral triangle; narrow yellow annulus just distally to transverse carina, and a green spot on distal margin; 8 black with minute distal green dot; 9-10 and appendages black. Superior appendage foliate, with short pedicel, about three and a half times as long as 10; inferior nearly half as long as superior. Abdomen 46 mm + sup. app. 6.5 mm, hindwing 42 mm, pterostigma (hindwing) 2.5 mm.

REMARKS: A single male from Sembe forest, Souanke District, M. Congo, January 1960, Watuliki leg. *H. ugandica* is a slightly smaller insect and differs in having the femora less blackened apically; pterostigma brown and only 3 mm in hindwing, venation browner; superior appendage (fig. 2b)

shorter, 6 mm, with longer pedicel, apical point more prominent. Holotype in National Museum, Bulawayo.

Acanthagyna africana (Beauvois, 1805)

Aeshna africana Beauvois, 1805, *Insectes recueillis en Afrique et en Amérique* ...: 67, pl. 3, W. Africa.

Ikom, Nigeria; Sembe Forest, M. Congo; Stanleyville, Congo (Plowes). A large species, widespread in tropical Africa.

A. cylindrata (Karsch, 1891)

Gynacantha cylindrata Karsch, 1891, *Ent. Nachr.* 17: 308; W. Africa.

Ikom, Nigeria; Mamfe, South Cameroons; Mekoum Forest, M. Congo. Also a fairly widespread species.

A. bullata (Karsch, 1891)

Gynacantha bullata Karsch, 1891, *loc. cit.* 17: 305, W. Africa.

Ketta and Mekoum Forests, M. Congo. One of the commonest species of the genus in Africa. It seems probable that Fraser's subspecies *elongata* (1957) from the Congo, with its very long appendages, is a distinct species.

A. ? flavipes (Fraser, 1956)

Gynacantha flavipes Fraser, 1956, *Rev. Zool. Bot. afr.* 54: 386, f.; Congo.

One male, Mekoum Forest, M. Congo, may be this species. It is near *victoriae* Pinhey (1961) from Uganda, but the appendages are more robust and the inferiors longer than in that species.

A. nigeriensis Gambles, 1956

Ent. mon. Mag. 92: 194, ff.; Northern Nigeria.

This Nigerian species is closely allied to the following one. One female was submitted from Ibadan, Nigeria (H. J. Sutton leg.).

A. sevastopuloi Pinhey, 1961

A survey of the dragonflies of Eeastern Africa: 100; Uganda.

A series of males submitted by Watuliki from Ketta and Mambili Forests, M. Congo, are slightly larger than Uganda specimens, on average measurements, but within the range for that species.

Family CORDULIIDAE

Neophya rutherfordi Sélys, 1881

C.R. Soc. ent. Belg. 25: 16, 17, f.; Old Calabar.

A mature male and a female from Ketta Forest, M. Congo, October 1959, may represent a distinct race of this delicate species, because of the extensive amber areas on the wings: in male almost to nodus in forewing, up to nodus in hindwing; in female to nodus in forewing, nearly to pterostigma in hindwing, thus leaving only a small hyaline apical patch on this wing.

Genus *MACROMIA* Rambur, 1842

Some notes are submitted here on structural details of males of some species. In other species, either these details are considered in another paper under preparation on Central African species, or only the female has been available.

M. aequatorialis (Martin, 1906), fig. 6

Phyllomacromia aequatorialis Martin, 1906, *Coll. Zool. Sélys* 17: 77; Cameroons, Gabon.

Lastoursville, Gabon. In the male of this dark species segment 8 has a strongly protruding ventrolateral fold; 9 is excised above in basal half; 10 has a stout tumour and vertical spine. Appendages black; hamule as in *M. picta* (Sélys) group, but posterior lobe slightly incurved on free margin.

M. bispina Fraser, 1954, fig. 9

Rev. Zool. Bot. afr. 49: 49, ff.; Uganda.

Ikom, Nigeria; Ketta, Mambili and Fekoum Forests, M. Congo. Segment 8 slightly swollen; 10 with robust cone and two small spines. Appendages black. West African examples are normally larger than the typical Uganda form, but one Mekoum male is an exception.

Uganda ♂♂, abdomen (without appendages) 36-38 mm, hindwing 32-34 mm.

Ikom, abdomen ♂ 40 mm, ♀ 42 mm, hindwing ♂ 35, ♀ 39 mm.

Ketta and Mekoum ♂♂, abdomen 42 mm, hindwing 37 mm.

Small Mekoum ♂, abdomen 38 mm, hindwing 33 mm.

Mekoum ♀, abdomen 43 mm, hindwing 40 mm.

M. bicornis Foerster, 1906, fig. 11

fb. nassau. *Ver. Naturk.* 59: 320; Somalia.

A dark male, from Zérékoré (French) Guinea, leg. Sv. Herold Olsen, 22.VI.1950, submitted for identification by Copenhagen Museum. Frons and vertex above all deep purple. Synthorax purple and metallic green in front, ferruginous and metallic green laterally; with three narrow yellow stripes,

on mesepisternum, metepisternum and metepimeron, respectively. Abdomen very black, with reduced yellow markings. Segment 8 scarcely expanded; 10 with cylindrical tumour bearing two spines. Hamules like *picta* (Sélys), but the hook more robust. Pterostigma and venation black; hindwing 41.5 mm.

M. congolica Fraser, 1955

Rev. Zool. Bot. afr. 52: 21; Katanga.

This is figured in another paper under preparation. Ketta Forest, M. Congo.

M. aeneothorax (Nunney, 1895), fig. 10

Ceratogomphus aeneothorax Nunney, 1895, *Ann. Mag. nat. Hist.* (6) 16: 349; W. Africa.

Ikom, Nigeria; Mekoum, Ketta, Mambili and Sembe Forests, M. Congo. Evidently common in West Africa. An enormous black species, related to *M. sophia* Sélys but lacking the gold thoracic band. Segment 8 not expanded; 10 with robust cone and single verticle spine. Appendages black; hamule very large and robust, with slender hook. Female terminalia very like *sophia*.

M. contumax (Sélys, 1879)

Phyllomacromia contumax Sélys, 1879, *Ent. mon. Mag.* 16: 103; W. Africa.

A solitary female from Lastoursville, Gabon, with strong, deep brown basal markings on the wings is probably this species.

M. funicularia Martin, 1906, fig. 7

Coll. Zool. Sélys 17: 75; Cameroons.

Ketta, Mekoum and Sembe Forests, M. Congo. Segment 8 not swollen; 10 with robust cone and vertical spine. Appendages black; hamule peculiar, the hook kinked and angled.

M. kochi (Gruenberg, 1911), fig. 4

Phyllomacromia kochi Gruenberg, 1911, *Ent. Rdsch.* 28: 103; Lake Victoria.

So far only known from Uganda. Very close to *M. picta* Sélys and probably only a melanic forest form of that species, which normally inhabits open bush country. Segment 8 with slight protrusion; 10 with small cone, and a spine pointing posteriad. Appendages yellow, but the inferior black ventrally; hamule as in *picta* (Sélys).

M. ? lieftincki Fraser, 1954, fig. 8

Rev. Zool. Bot. afr. 49: 65, f.; Fernando Po.

Males from Etoumbi and Ketta Forests, M. Congo, agree fairly well with

this species but lack the basal swelling on the superior appendage. Thorax with three prominent yellow lateral stripes. Frons and vertex metallic blue-black. Abdomen mainly black. Segment 8 a little swollen laterally and postdorsally; 10 with robust cone and vertical spine, the cone with a small posterior hair-tuft. Appendages black; hamule very robust, with an exceptionally long, inwardly curved hook, closely applied to the hamular base (c.f. the "claw-like hook" of Fraser's *lieftincki*), and with a prominent latero-posterior ridge. Abdomen (without appendages) 48 mm.

M. onerata Martin, 1906

Coll. Zool. Sélvs 17: 74, Tanganyika, Sierra Leone.

A tropical African species which the present author has taken in Katanga, Ikom, Nigeria. To be figured in another paper.

M. pallidinervis Foerster, 1906, fig. 3

Jb. nassau. Ver. Naturk. 59: 317; N. E. Africa.

Only known from East Africa. Segment 8 with strongly protruding fold; 9 above with slight tumour; 10 without a true cone, but with a very elongate, anteriorly procumbent setophore, half yellow and half black, terminating in a single spine. Superior appendage black, with row of small ventro-basal spines; inferior yellow; hamule of *picta* group.

M. schoutedeni Fraser, 1954, fig. 5

Rev. Zool. Bot. afr. 49: 52, f.; Congo.

From the Congo, but not in the collections under consideration here. Segment 8 as in *picta* (Sélvs); 10 also, but with the spine vertical. Appendages yellow, superior with ventral tooth; hamule with hook no longer than *picta* but more curled.

Family LIBELLULIDAE

In these West African collections material of this family was more extensive than of other families. A few of the more interesting species will be discussed here.

Genus *TETRATHEMIS* Brauer, 1868

Fraser (1941) gave a key to African members of this genus and described a new species, *T. bifida*, from Uganda. *T. godiardi* Lacroix, 1921, was omitted from this key, and there is a more recently described species, *denticauda* Fraser, 1954. Of the African members of the genus, *cameronensis* Sjoestedt, 1899, and *bifida* Fraser have the superior appendages of the male

about three times as long as segment 10. It is these last species with which the present remarks are concerned.

In conversation with the present author in 1958 Mr J. Cowley expressed some doubt about Fraser's identification of Sjoestedt's *camerunensis*, considering that this species has strongly bifid apices of the inferior appendage. Sjoestedt's description does not clarify this matter (1899). Concerning the anal appendages he says "Anhänge schwarz, schmal, von oben gesehen mit stark divergierenden Spitzen, die Oberen von der Seite gesehen gleich breit, zugespitzt, etwas länger als das 8. Segment, die Unteren etwa 1/5 kürzer; ..." Unfortunately the type in the Stockholm Museum lacks its abdomen. Ris (1909: 53, fig. 17) does not discuss the shape of the apex of the inferior appendage, but from the drawing, which may be assumed to be accurate although it was from a specimen in Martin's collection and not from the type, it would appear that the apical notch is a shallow one. This cannot be accepted as conclusive, but these species are very close in other respects and the present author accepts Fraser's interpretation.

In material of this genus collected by the author in West Africa there is a distinctive third member of those species with elongate superiors, which is described below as *sulci*, since the appendage has a deep, U-shaped furrow (fig. 13). In *bifida* (fig. 14) there is a v-shaped notch, not so deep; and in *camerunensis* (fig. 15) there is only a shallow depression.

Some of the localities for these three species are: *T. camerunensis*: Cameroons; Eastern Nigeria: Ajassor, near Ikom; Ghana: Prah-Annam; Uganda: Entebbe, Kampala and Katera. *T. bifida*: Ghana: Prah-Annam and ? Esuboni (♀ only); Northern Congo and Middle Congo: Bondo, Buta and Forests; Ruwenzori: Mutwanga; Uganda: Bwamba Forest and Kaluba, South Busoga (Corbet). *T. sulci*: Cameroons: Douala.

Tetrathemis sulci spec. nov., fig. 13

♂ - HOLOTYPE (mature): Very like *T. bifida* Fraser and *T. camerunensis* Sjoestedt. Labium bright orange, the posterior lobe and inner margins of lateral lobes black; labrum black; epistome, genae and lower lateral angles of frons pale greenish-yellow; rest of frons and vertex deep metallic blue. Thoracic markings normal; mid-dorsal stripe yellow, lateral bands green, becoming yellow ventrally. Venation and pterostigma black; forewing with 8 Ax, 7 Px; only the merest vestige of basal amber. Abdomen normally marked. Superior appendages (fig. 13) at least three times as long as 10, their apices acute and divergent, as in the other close relatives. Inferior appendage with a very deep, U-shaped incision. A slightly larger insect than *camerunensis*. Abdomen 17.5 mm, hindwing 23 mm, pterostigma 2 mm.

♀ - ALLOTYPE (mature): Very similar to male. Abdomen stouter. Vulvar scale typical. Abdomen 18.5 mm, hindwing 26.5 mm, pterostigma 2.2. mm.

REMARKS: Holo- and allotype taken in forest a few miles East of Douala, Cameroons, March 1958; in collection of National Museum, Bulawayo.

Allorhizucha klingi Karsch, 1890

Berl. ent. Z. 33: 390; Togo.

Prah-Annam, Ghana; Ketta, Sembe, Mambili and Mekoum Forests, M. Congo.

A. preussi Karsch, 1891

Ent. Nachr. 17: 80; Cameroons.

Ketta and Etoumbi Forests; and from other territories.

Micromacromia camerunica Karsch, 1890

Berl. ent. Z. 33: 389; Cameroons.

Mekoum Forest, M. Congo. Common in tropical African forests.

Neodythemis africana Fraser, 1954, fig. 12

Rev. Zool. Bot. afr. 50: 257; Congo.

Long series, Ketta and Mekoum Forest, M. Congo. A little known and local species.

Hadrothemis coacta (Karsch, 1891)

Thermorthemis coacta Karsch, 1891, *Ent. Nachr.* 17: 60; Cameroons.

One of the commonest dragonflies in collections from West Africa. Prah-Annam, Ghana; Vane, Togoland; Ketta and Mekoum Forests.

H. camarensis (Kirby, 1889)

Orthetrum camarensis Kirby, 1889, *Proc. zool. Soc. Lond.* 12: 298; Cameroons.

Rather less common than *H. coacta* (Karsch). Prah-Annam, Ghana; Ikom, Nigeria; Ketta Forest, M. Congo; Stanleyville, Congo; Lastoursville, Gabon. An example from Etoumbi Forest is very deeply fumose all over the wings, almost like *H. vrijdaghi* Schouteden, but the blue frons is distinctive.

H. defecta (Karsch, 1891)

Thermorthemis defecta Karsch, 1891, *loc. cit.* 17: 61, 62; Sierra Leone.

Nearly as common as *H. coacta* (Karsch). Ikom, Nigeria; Ketta, Etoumbi and Mekoum Forests, M. Congo; Lastoursville, Gabon.

H. versuta (Karsch, 1891)

Thermorthemis versuta Karsch, 1891, *loc. cit.* 17: 62; Cameroons.

Ketta, Etoumbi and Mekoum Forests, M. Congo. Common in West Africa and the present author has taken it in Northern Rhodesia.

H. infesta (Karsch, 1891)

Archiclops infestus Karsch, 1891, *loc. cit.* 17: 79; Cameroons.

Prah-Annam, Ghana; Stanleyville, Congo; Lastoursville, Gabon; Etoumbi Forest, M. Congo.

Orthetrum stemmale kalai Longfield, 1936

Trans. R. ent. Soc. Lond. 85: 487, 493.

Although described from an island (Kalai) near the Victoria Falls this species does not appear to be common in Rhodesia. It is a widespread tropical African species and the Zambezi is probably the southern limit of its range. Prah-Annam, Ghana.

O. austeni (Kirby, 1900)

Thermorthemis austeni Kirby, 1900, *Ann. Mag. nat. Hist.* (7) 6: 72, ff.; Sierra Leone.

Local in the larger forests of tropical Africa. Ketta Forest, M. Congo.

O. africanum (Sélys, 1887)

Lepthemis sabina africana Sélys, 1887, *Ann. Soc. ent. Belg.* 31: 21; Cameroons.

Stanleyville, Congo. A very local species in tropical Africa.

Palpopleura lucia (Drury, 1773)

Libellula lucia Drury, 1773, *Illustrations of Natural History ... Insects, etc.* 2: 82; forma *graffei* Martin, 1912, *Feuill. jeun. Nat.* 42: 92; French Guinea.

One male of forma *graffei*, amongst typical examples, from Mambili Forest, M. Congo; others from Lastoursville, Gabon.

Aethiothemis watulikii spec. nov., figs. 16 a-b

♂·*Holotype* (mature): Labium broadly black in centre, yellow on lateral lobes, edged finely with black; labrum black; epistome, genae and lower edge of frons pale grey-green; rest of frons and vertex dark metallic blue; back of occiput black, lower posterior margin along the eye yellow. Thorax black; narrow, fusiform, grey-green antehumeral; mesepimeron with greenish stripe; metepisternum with incomplete narrow stripe; metepimeron mainly greenish. Legs all black; claw-hook very short. Venation and pterostigma blackish-brown; wings fumose with small amber basal patches; membranule blackish. Discoidal cell of forewing a broad right-angled triangle with costal edge more than half the proximal edge; all triangles and hypertriangles free; subtriangle in forewing crossed. Forewing with 10-11 Ax, the last complete; discoidal field of two rows, expanding before nodus; anal loop long but blunt. Cu₂

curved. Abdomen and appendages black, abdomen swollen at base, the remaining segments slender; a pale greenish lateral patch on segment 1; a post-dorso-lateral patch and a sub-lateral stripe on segment 2; a baso-lateral yellowish-green patch on segment 3. Abdomen (without appendages) 23 mm, hindwing 25 mm, pterostigma 2.5 mm.

REMARKS: Named after Mr B. K. Watuliki, who collected one male in Mambili Forest, M. Congo, June 1960. It is nearest to *A. basilewskyi* Fraser, 1954, of the named species of *Aethiothemis* with its dark blue frons and smoky wings, as well as the slender body. It differs in having narrower antehumerals on the thorax and the sides are mainly black with pale stripes instead of the reverse in *basilewskyi*. Hamule robust. The broad triangle of the forewing is presumably an indication that this is a primitive member of the genus. In other respects it agrees with the usual venation of the group whose generic status is somewhat controversial. Holotype in National Museum, Bulawayo.

Thermochoria equivocata Kirby, 1889

Trans. Zool. Soc. Lond. 12: 339, f.; West Africa.

The typical form, with a black subcostal streak of variable length on the forewing, is represented in these collections from Kabambare (Katanga) and Stanleyville, in the Congo, collected by Plowes and Mpala. Amongst these is also the unnamed form mentioned by Ris (1919) from Katanga, lacking the streak altogether: from Nia Nia, Katanga and Kabambare. One other male had traces of the streak, thus indicating that it is no more than a variety occurring in that region. It is quite distinct from *T. jeanneli* (Martin) also lacking the streak. The present author has taken the latter not far from the type locality on the East African coasts. It is a different species from *equivocata*. The form *picta* Sjoestedt, 1899, from Cameroons, a variety of *equivocata* with a very long subcostal streak, as well as other black lines on the forewing, and a shorter subcostal streak on the hindwing, seems to be much less common. Examples in these collections are from Ikom, Nigeria and Lastoursville, Gabon.

Chalcostephia flavifrons Kirby, 1889

loc. cit. 12: 337; Angola.

Males taken by the author in Cameroons and Nigeria, and more particularly the Gabon examples sent by Rougeot, tend to have narrow brown wing apices, unlike those of Uganda and East Africa, in which the apices are hyaline. Lastoursville, Gabon; Etoumbi Forest, M. Congo.

Porpacithemis dubia Fraser, 1954

Rev. Zool. Bot. afr. 50: 262, f.; Gabon.

One male, Etoumbi Forest, M. Congo. The present author has also taken specimens in Katanga and Northern Rhodesia.

Trithemis fumosa spec. nov., fig. 20

♂ - HOLOTYPE (mature): Labium yellow, with the median lobe and a broad inner margin to the lateral lobes black; labrum black; frons and rest of face ochreous, with narrow black margins to each part; frontal groove shallow; vertex and a broad basal band covering half the dorsum of the frons black with bronze-green reflection; occipital triangle brown. Synthorax black to just below humeral suture, with a broken yellow antehumeral stripe consisting of an elongate ventral triangle and a small dorsal spot. Sides of thorax yellow, with the usual black, irregular, horizontal stripe and black edgings to segments. Legs black, brown on coxae and trochanters. Wings light fumose, without amber basal marking; tinged with golden-brown in costal zone from before nodus to apex and with a large apical patch of the same colour. Hindwing also tinted posteriorly, but less strongly than on costa and apex. Forewing with $12\frac{1}{2}$ Ax, the last incomplete, 7-8 Px; pterostigma ferruginous, between black veins. Abdomen triquetral, tapering, not constricted at segment 3; black with double row of yellow lateral streaks except on segments 9-10, with only the more dorsal streaks; ventrally also with yellow streaks. Abdomen $\frac{3}{4}$ as long as hindwing. Anal appendages brown. Hook of hamule moderate. Abdomen (without appendages) 22 mm, hindwing 29 mm, pterostigma 3 mm.

REMARKS: Two males, Etoumbi Forest, Makoua, August 1960 (B. K. Watuliki). By body markings and triquetral abdomen this is near *pruinata* Karsch and *ellenbecki* Foerster, but it differs in lacking pruinosity and in having fumose wings (hence the name) and brown apices. In its absence of blue on the body and in the presence of fumosity on the wings, it is like the paler winged *anomala* Pinhey, in which the abdomen is more slender and the anterior lamina more elongate.

Holotype in National Museum, Bulawayo; paratype in British Museum (Nat. Hist.), London. Female unknown.

Trithemis pruinata Karsch, 1898

Ent. Nachr. **24**: 342 (nom. nud.); idem 1899, *Ibid.* **25**: 369; Togo.

This dark blue species, so easily mistaken in the field for *ellenbeckii* Foerster (*risi* Longfield) until the accessory appendages are examined, seems to be widespread but uncommon. In the collections under review, only from Lastoursville, Gabon.

T. tropicana Fraser, 1953

Rev. Zool. Bot. afr. **48**: 252; Congo.

This striking species has been submitted from Sembe, Mekoum and Mambili Forests, M. Congo, and Lastoursville, Gabon.

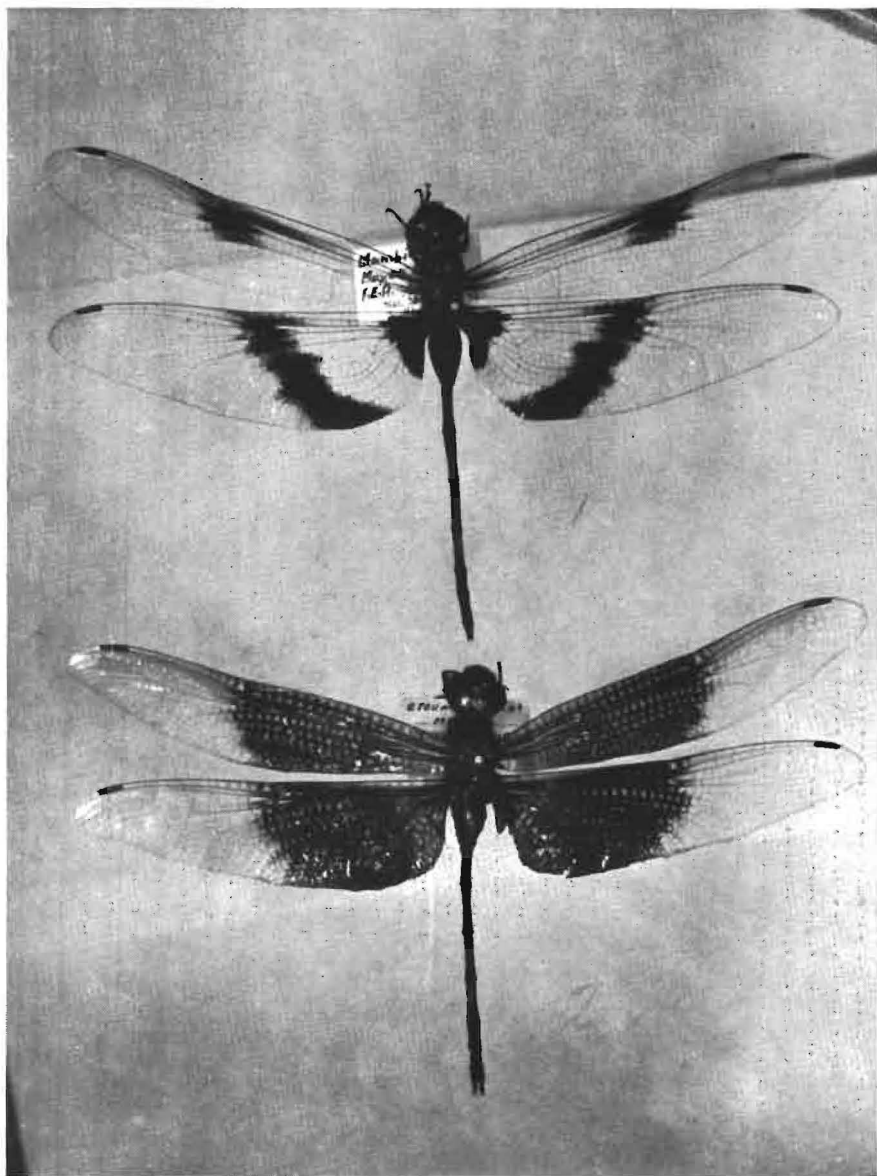


Plate 1. *Zygonyx pretentiosa* Fraser, immature and (?) aged females,

Zygonyx fallax (Schouteden, 1914)

Pseudomacromia fallax Schouteden, 1934, *Ann. Mus. Congo belge 4to* (c). **3** (1): 32; Congo.

One female Rutshuru, Congo, collected by Plowes.

Z. pretiosa (Karsch, 1891)

Pseudomacromia pretiosa Karsch 1891, *Ent. Nachr.* **17**: 74, f.; Cameroons.

Ikom, Nigeria collected by Watuliki. Only females are known of this magnificent amber-winged insect.

Z. pretentiosa Fraser, 1957. Plate 1, figs. 1-2

Rev. Zool. Bot. afr. **55**: 344, f.; Congo.

Some females of this insect were collected in Mambili and Etoumbi Forests, M. Congo by Watuliki (plate 1). Four of the females were probably immature. The oblique brown transverse band across the middle of the wings is incomplete on the forewing and much narrower on the hindwing than in Fraser's illustration. These specimens were captured in the months of June to August, 1960. Another female (fig. 2), probably the same species, is obviously much older since the wing veins are deep brown in the area of the fasciae and the cells are paler; a condition frequently seen in aging species which have wing-markings. But in this female, however, the oblique band has given place to a complete reddish-brown area covering the whole of each wing from base to nodus; the exterior limit of this area irregular but showing a tendency to be straight (nearly perpendicular to the nodus), instead of falling back obliquely. In the postnodal costal region of the forewing there is an amber streak as far as the pterostigma (as in the less mature examples); and the base of the hindwing shows the deep brown triangular patch (as in the others), although this is nearly obscured by the wide brown fascia. This female was captured in September, 1960. It may ultimately prove to be another species; on the other hand it may be the final stage of the female *pretentiosa*. Males of a *Zygonyx* species which are probably this species were taken by Mr Watuliki in the Ketta Forest. They appear to be the same as *Z. prodigiosa* Fraser, 1958. If this surmise is correct then *prodigiosa* is the unknown male of *pretentiosa*.

Z. rougeoti Pinhey, 1961

Occ. Pap. nat. Mus. S. Rhod. **3** (24B): 514, fig. 3.

A female, seen by the author flying with *rougeoti* males near Mamfe, South Cameroons, appeared on the wing to have as much amber on the wings as *pretiosa* (Karsch). The stream was close to the Ikom locality where Mr Watuliki collected females of the latter. Ketta Forest, M. Congo; Lastoursville, Gabon.

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